

BITSAT 2025 June 22 Shift 1 Question Paper

Time Allowed :3 Hours	Maximum Marks :390	Total Questions :130
------------------------------	---------------------------	-----------------------------

General Instructions

1. The **BITSAT 2025** (Birla Institute of Technology and Science Admission Test) is conducted in **Computer-Based Test (CBT)** mode.
2. The duration of the test is **3 hours (180 minutes)**.
3. The question paper consists of **130 multiple-choice questions (MCQs)** divided into four sections:
 - **Physics – 30 Questions**
 - **Chemistry – 30 Questions**
 - **English Proficiency and Logical Reasoning – 20 Questions**
 - **Mathematics/Biology – 50 Questions**
4. Each correct answer carries **3 marks**, and each incorrect answer leads to a **penalty of 1 mark**.
5. After attempting all 130 questions, candidates can attempt up to **12 additional questions** (4 each from Physics, Chemistry, and Mathematics/Biology) — only if time permits.
6. The language of the question paper is **English only**.
7. Candidates must reach the test center **at least 1 hour before** the commencement of the examination.
8. Candidates must carry:
 - **BITSAT 2025 Hall Ticket**
 - **Valid Photo ID Proof** (Aadhaar, Passport, PAN, Driving Licence, etc.)
9. Rough work must be done only on the provided sheets. Additional sheets will not be supplied.
10. Use of **calculators, mobile phones, smart watches, or any other electronic devices** is strictly prohibited.
11. Follow all **invigilator's instructions** carefully. Any malpractice will result in **cancellation of candidature**.

1. A block of mass 2 kg slides on a frictionless horizontal surface with a velocity of 3 m/s. It collides elastically with another block of mass 3 kg initially at rest. What is the velocity of the 2 kg block after the collision?

- (A) 1 m/s
 - (B) 1.5 m/s
 - (C) 2 m/s
 - (D) 2.5 m/s
-

2. The electric field at a point on the axis of a uniformly charged ring of radius R at a distance x from its center is given by:

$$E = \frac{1}{4\pi\epsilon_0} \frac{Qx}{(x^2 + R^2)^{3/2}}$$

If $x = 2R$, what is the magnitude of the electric field?

- (A) $\frac{kQ}{R^2}$
 - (B) $\frac{kQ}{2R^2}$
 - (C) $\frac{kQ}{4R^2}$
 - (D) $\frac{kQ}{9R^2}$
-

3. A gas expands isothermally and reversibly from a volume V to $2V$. If the initial pressure is P , what is the final pressure?

- (A) $\frac{P}{2}$
 - (B) $\frac{P}{4}$
 - (C) $2P$
 - (D) P
-

4. For a reaction $A \rightarrow B$, the concentration of A decreases from 0.8 M to 0.2 M in 10 minutes. If the rate constant is 0.1 min^{-1} , what is the order of the reaction?

- (A) 0
 - (B) 1
 - (C) 2
 - (D) 3
-

5. Find the value of the integral:

$$\int_{-\pi}^{\pi} \sin^3(x) dx$$

- (A) 0
- (B) $\frac{\pi}{2}$
- (C) $\frac{\pi}{4}$
- (D) π

6. A bag contains 5 red, 3 blue, and 2 green balls. If two balls are drawn at random without replacement, what is the probability that both are red?

- (A) $\frac{1}{3}$
- (B) $\frac{1}{9}$
- (C) $\frac{2}{9}$
- (D) $\frac{1}{5}$

7. Find the angle between the vectors $\mathbf{a} = (2, -1, 3)$ and $\mathbf{b} = (1, 4, -2)$.

- (A) 45°
- (B) 60°
- (C) 90°
- (D) 120°

8. If $A = \begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}$, find the determinant of A^2 .

- (A) 0
 - (B) 4
 - (C) 9
 - (D) 25
-